Remarks/Arguments:

Claims 1-4 have been amended. Claims 5 and 6 have been added. No new matter is introduced herein. Claims 1-6 are pending.

Claims 1 and 3-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka (U.S. Patent No. 6,915,118) (Matsuoka '118 herein), further in view of Gourgue et al. (U.S. Patent No. 6,400,775) and Matsuoka et al. (U.S. Patent No. 6,400,774) (Matsuoka '774 herein). It is respectfully submitted, however, that these claims are now patentable over the cited art for the reasons set forth below.

Claim 1, as amended, includes features neither disclosed nor suggested by the cited art, namely:

> ... an amplitude-phase controller for controlling an amplitude and phase of an **input** transmission base-band signal ...
>
> ... an out-band power calculator for computing an **out-band power outside of a transmission band** from the frequency spectrum ...
>
> ... an error coefficient calculator for computing an error characteristic ... **based on the out-band power** from the out-band power calculator **and the selected characteristic** from the fixed coefficient storage ...
>
> ... an amplitude-phase change calculator for computing an amplitude change and a phase change **based on the selected characteristic** from the fixed-coefficient storage **and the error characteristic** from the error coefficient calculator ... (Emphasis Added)

Claim 2 includes a similar recitation. Support for the amendments can be found, for example, at page 10, line 26 - page 12, line 20; page 14, line 13 - page 15, line 14; page 18, lines 8-19; Fig. 1 (claim 1) and Fig. 2 (claim 2). Claims 1 and

2 have also been amended to clarify the language and claims 3 and 4 have been amended to correspond to amended claim 1.

Matsuoka '118 discloses, in Fig. 1, a linearly compensated amplifier that include a phase and amplitude controller 109 and a phase controller 112 in order to eliminate a non-linear distortion component from the amplified signal of the power amplifier 106 (col. 3, lines 17-39). Matsuoka '118 does not disclose or suggest Applicants' claimed features of "an amplitude-phase controller for controlling and amplitude and phase of an input transmission base-band signal" (emphasis added). In addition, as acknowledged by the Examiner, Matsuoka '118 does not disclose or suggest a frequency converter, a Fourier transformer, an out-band power calculator, an amplitude calculator, an error coefficient calculator, or an amplitude-phase change calculator, as recited in claim 1. Thus, Matsuoka '118 does not include all of the features of claim 1.

Gourgue et al. disclose that, in a testing stage, harmonics computed from a Fourier transform are used to reconstruct the amplified signal. The reconstructed signal is compared with the input signal in order to construct a table of predistortion parameters (col. 1, line 60 - col. 2, line 10; col. 6, lines 1-55 and Fig. 4). Gourgue et al. do not disclose or suggest Applicants' claimed features of "an out-band power calculator for computing an out-band power outside of a transmission band from the frequency spectrum signal" or "an error coefficient calculator for computing an error characteristic ... based on the out-band power ... and the selected characteristic from the fixed coefficient storage" (emphasis added). These features are neither disclosed nor suggested by Gourgue et al. In addition, Gourgue et al. are silent regarding an amplitude-phase change calculator that is based on a selected characteristic and the error characteristic.

The Examiner asserts at page 3, lines 18-20 of the Office Action, that Gourgue et al. disclose an out-band power computing section for computing an out-band power. Applicants respectfully disagree. Gourgue et al. disclose, at col. 1, line 60 - col. 2, line 10, that harmonics computed from a Fourier transform are used to reconstruct the amplified signal. Because the harmonics are used to reconstruct the amplified signal, the skilled person would consider that Gourgue et al. disclose in-band harmonics. The skilled person would not consider the in-band harmonics of Gourgue et al. to be equivalent to an out-band power calculator for computing an out-band power outside of a transmission band, as recited in claim 1. Applicants respectfully request that the Examiner provide sufficient evidence of such a feature in Gourgue et al. Gourgue et al. are silent on computing an out-band power outside of a transmission band. Thus, Gourgue et al. do not include all of the features of claim 1.

Matsuoka '774 discloses, in Fig. 5, an updating portion 223 that calculates an error between the input signals and the recovered signals in order to update stored coefficients (col. 30, line 57 - col. 31, line 11). Matsuoka '774 does not disclose or suggest Applicants' claimed features of "an out-band power calculator for computing an out-band power outside of a transmission band from the frequency spectrum signal" or "an error coefficient calculator for computing an error characteristic ... based on the out-band power ... and the selected characteristic from the fixed coefficient storage" (emphasis added). These features are neither disclosed nor suggested by Matsuoka '774. Although Matsuoka '774 discloses updating the stored coefficients using the recovered signals (i.e., a feedback signal), Matsuoka '774 is silent on computing an out-band power outside of a transmission band and using the out-band power to calculate an error characteristic. Because Matsuoka '774 does not

disclose or suggest an error coefficient calculator that computes an error characteristic based on out-band power, Matsuoka '774 cannot disclose an amplitude-phase change calculator that is based on the error characteristic. The Examiner asserts at page 4, lines 8-11 that Matsuoka '774 disclose an out-band power measuring section. Applicants respectfully disagree. As discussed above, Matsuoka '774 disclose calculating an error between the input signals and the feedback signal from the power amplifier, but does not disclose or suggest calculating an out-band power outside of the transmission band. Thus, Matsuoka '774 do not include all of the features of claim 1.

Applicants' invention, as recited in claim 1, includes features and advantages neither disclosed nor suggested by the cited art. Because the distortion compensator includes an out-band power calculator, if the power amplifier experiences an out-band abnormality, the distortion compensator updates the error coefficient calculator based on the out-band power. The distortion compensator of the subject invention, thus, adjusts the amplitude and phase of the input transmission base-band signal according to the abnormality. Accordingly, transmission of the input signal continues even when there is an out-band abnormality, and may, for example, avoid interference from adjacent channels or destruction of the power amplifier.

In addition, because the subject invention is provided with an out-band power calculator, the distortion compensator may stop operation of the power amplifier when an out-band abnormality is detected (specifically recited in claim 4). Matsuoka '774 updates the compensation coefficient when an abnormality occurs in the band, but does not disclose or suggest any detection of an out-band abnormality or compensation when an out-band abnormality occurs. Therefore, in Matsuoka '774, an out-band abnormality may degrade the performance of the power amplifier or the

transmission of the input signal. Because Matsuoka '774 does not determine an out-band abnormality, it cannot disclose stopping operation of the power amplifier if an out-band abnormality is detected (as recited in claim 4). As discussed above, none of the cited art disclose or suggest an out-band power calculator for computing an out-band power outside of a transmission band or that the out-band power is used to calculate an error characteristic. Accordingly, allowance of claim 1 is respectfully requested.

Claims 3 and 4 include all of the features of claim 1 from which they depend. Accordingly, claims 3 and 4 are also patentable over the cited art for at least the reasons set forth above.

Claim 2 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuoka '118, in view of Gourgue et al., and Matsuoka '774, and further in view of Kusunoki (U.S. Patent No. 6,766,151). It is respectfully submitted, however, that this claim is now patentable over the cited art for the reasons set forth below.

Amended claim 2, although not identical to claim 1, includes features similar to claim 1 that are neither disclosed nor suggested by the cited art. Namely, an out-band power calculator for computing an out-band power outside of a transmission band and an error coefficient calculator for computing an error characteristic based on the out-band power. As described above, these features are neither disclosed nor suggested by Matsuoka '118, Gourgue et al., or Matsuoka '774. Kusunoki does not make up for the deficiencies of Matsuoka '118, Gourgue et al., or Matsuoka '774. Accordingly, allowance of claim 2 is respectfully requested.

Claims 5 and 6 have been added. No new matter is introduced herein. New claims 5 and 6 depend from claim 2 and correspond to respective claims 3 and 4.

Basis for the amendment can be found, for example, at page 21, lines 14-23 (claim 5); and page 22, lines 1-8 (claim 6). Accordingly, claims 5 and 6 are also patentable over the cited art for at least the same reasons as claim 2.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

Lawrence E. Ashery, Reg. No. 34,515
Attorney for Applicants

DMG/ds/fp

Dated: February 28, 2007

P.O. Box 980
Valley Forge, PA 19482
(610) 407-0700

The Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. **18-0350** of any fees associated with this communication.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on:

February 28, 2007 Fran Petrillo

90863